

In re Patent Application of:
RIMI ET AL.
Serial No. 10/768,400
Filing Date: January 30, 2004

In the Claims:

This listing of claims replaces all prior versions and listing of claims in the application.

Claims 1-17 (Cancelled).

18. (Currently Amended) A cellular communications method for a cellular communications system using a plurality of synchronization codes and comprising:

during a first time interval, performing slot synchronization by using at least one correlator to correlate a received signal with synchronization codes in a primary sequence to generate corresponding synchronization values, the at least one correlator comprising a first matched filter and a second matched filter connected in series with a plurality of masking circuits downstream from the second matched filter; and

during a second time interval, performing frame synchronization and cell codegroup identification by using the at least one correlator to correlate the received signal with synchronization codes in a secondary sequence to generate corresponding synchronization values.

19. (Previously Presented) The method of Claim 18 further comprising enabling the at least one correlator by generating an enable signal therefor during the second time interval.

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20. (Currently Amended) The method of Claim 18 ~~wherein the at least one correlator comprises first and second filters;~~ and further comprising:

arranging the secondary sequence into a first portion and a second portion; and

providing the first portion of the secondary sequence to the first matched filter, and the second portion of the secondary sequence to the second matched filter.

21. (Previously Presented) The method of Claim 20 further comprising switching from the correlation of one synchronization code in the secondary sequence to another by changing values of the second portion of the secondary sequence.

22. (Previously Presented) The method of Claim 21 wherein the primary sequence has a plurality of weights associated therewith; and further comprising changing signs on at least one of the weights to switch from the primary sequence to the first portion of the secondary sequence.

23. (Currently Amended) A cellular communications device for a cellular communications system using a plurality of synchronization codes comprising:

at least one correlator for correlating a received signal with synchronization codes in a primary sequence during a first time interval to generate corresponding synchronization values, and for correlating the received signal with

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synchronization codes in a secondary sequence during a second time interval to generate corresponding synchronization values;
said at least one correlator comprising a first matched filter and a second matched filter connected in series;
a plurality of masking circuits connected downstream from said second matched filter; and
a processor for performing slot synchronization, frame synchronization, and cell codegroup identification based upon the corresponding synchronization values.

24. (Currently Amended) The cellular communications device of Claim 23 ~~wherein said at least one correlator comprises first and second filters,~~ wherein the secondary sequence is arranged into a first portion and a second portion, wherein the first portion of the secondary sequence is provided to the first matched filter, and wherein the second portion of the secondary sequence is provided to the second matched filter.

25. (Currently Amended) A cellular communications device for a cellular communications system using a plurality of synchronization codes comprising:

at least one correlator for correlating a received signal and synchronization codes in a primary sequence for performing slot synchronization on a primary channel, and for correlating the received signal and synchronization codes in a secondary sequence for obtaining corresponding values thereof;
said at least one correlator comprising a first matched filter and a second matched filter connected in series;

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a plurality of masking circuits connected downstream
from said second matched filter;

a detector for determining at least one maximum value
from among the corresponding values and identifying a number of
the synchronization codes based thereon; and

a processor for determining the frame synchronization
and for identifying the codegroup based upon the number of
synchronization codes.

26. (Previously Presented) The device of Claim 25
further comprising a controller for generating at least one
enabling signal for controlling switching of said at least one
correlator between the primary sequence and the secondary
sequence.

27. (Canceled)

28. (Canceled)

29. (Currently Amended) The device of Claim ~~28~~ 25
wherein said second matched filter comprises a plurality of
outputs; and wherein said masking circuits are arranged in
parallel, each masking circuit being connected to a respective
output of said second matched filter.

30. (Currently Amended) The device of Claim ~~28~~ 25
wherein said second matched filter comprises a plurality of
outputs; wherein said masking circuits have weights associated

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therewith for weighting the outputs of said second matched filter; and further comprising a code generator for causing said masking circuits to change respective weights.

31. (Currently Amended) The device of Claim ~~28~~ 25 wherein at least some of said masking circuits are arranged in a set of masks corresponding to a first code set; and further comprising a circuit for determining remaining synchronization codes belonging to a subset identified by said processor.

32. (Canceled)

33. (Previously Presented) The device of Claim 25 wherein the received signal complies with Code-Division Multiplex Access/Third-Generation Partnership Project Frequency Division Duplex (CDMA/3GPP FDD) standard.

34. (Previously Presented) The device of Claim 25 wherein the received signal complies with Code-Division Multiplex Access/Third-Generation Partnership Project Time Division Duplex (CDMA/3GPP TDD) standard.

35. (Previously Presented) The device of Claim 25 wherein the received signal complies with at least one of the Universal Mobile Telephone Service (UMTS), Code-Division Multiple Access 2000 (CDMA2000), IS95, and WBCDMA standards.

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36. (Currently Amended) A computer-readable medium having computer-executable instructions for performing steps comprising:

during a first time interval, performing slot synchronization by using at least one correlator to correlate a received signal with synchronization codes in a primary sequence to generate corresponding synchronization values, the at least one correlator comprising a first matched filter and a second matched filter connected in series with a plurality of masking circuits connected downstream from the second matched filter; and

during a second time interval, performing frame synchronization and cell codegroup identification by using the at least one correlator to correlate the received signal with synchronization codes in a secondary sequence to generate corresponding synchronization values.

37. (Currently Amended) The computer readable medium of Claim 36, ~~wherein the at least one correlator comprises first and second filters;~~ and further comprising computer-executable instructions for performing steps comprising:

arranging the secondary sequence into a first portion and a second portion; and

providing the first portion of the secondary sequence to the first matched filter, and the second portion of the secondary sequence to the second matched filter.

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38. (New) A cellular communications device for a cellular communications system using a plurality of synchronization codes comprising:

at least one correlator for correlating a received signal and synchronization codes in a primary sequence for performing slot synchronization on a primary channel, and for correlating the received signal and synchronization codes in a secondary sequence for obtaining corresponding values thereof;

said at least one correlator comprising a first matched filter and a second matched filter connected in series;

said second matched filter comprising a plurality of chains of memory elements being connected in series, and a selector for selectively removing from said series at least one of said chains;

a detector for determining at least one maximum value from among the corresponding values and identifying a number of the synchronization codes based thereon; and

a processor for determining the frame synchronization and for identifying the codegroup based upon the number of synchronization codes.

39. (New) The device of Claim 38 further comprising a controller for generating at least one enabling signal for controlling switching of said at least one correlator between the primary sequence and the secondary sequence.

40. (New) The device of Claim 38 wherein said second matched filter comprises a plurality of outputs; and wherein said

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masking circuits are arranged in parallel, each masking circuit being connected to a respective output of said second matched filter.

41. (New) A cellular communications device for a cellular communications system using a plurality of synchronization codes comprising:

at least one correlator for correlating a received signal with synchronization codes in a primary sequence during a first time interval to generate corresponding synchronization values, and for correlating the received signal with synchronization codes in a secondary sequence during a second time interval to generate corresponding synchronization values;

said at least one correlator comprising a first matched filter and a second matched filter connected in series;

said second matched filter comprises a plurality of chains of memory elements, said chains of memory elements being connected in series, and a selector for selectively removing from said series at least one of said chains; and

a processor for performing slot synchronization, frame synchronization, and cell codegroup identification based upon the corresponding synchronization values.

42. (New) The cellular communications device of Claim 41 wherein the secondary sequence is arranged into a first portion and a second portion, wherein the first portion of the secondary sequence is provided to the first matched filter, and

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wherein the second portion of the secondary sequence is provided to the second matched filter.

43. (New) A cellular communications method for a cellular communications system using a plurality of synchronization codes and comprising:

during a first time interval, performing slot synchronization by using at least one correlator to correlate a received signal with synchronization codes in a primary sequence to generate corresponding synchronization values, the at least one correlator comprising a first matched filter and a second matched filter connected in series with the second matched filter comprising a plurality of chains of memory elements being connected in series, and a selector for selectively removing from the series at least one of the chains; and

during a second time interval, performing frame synchronization and cell codegroup identification by using the at least one correlator to correlate the received signal with synchronization codes in a secondary sequence to generate corresponding synchronization values.

44. (New) The method of Claim 43 further comprising enabling the at least one correlator by generating an enable signal therefor during the second time interval.

45. (New) The method of Claim 43 further comprising:
arranging the secondary sequence into a first portion and a second portion; and

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providing the first portion of the secondary sequence to the first matched filter, and the second portion of the secondary sequence to the second matched filter.

46. (New) A computer-readable medium having computer-executable instructions for performing steps comprising:

during a first time interval, performing slot synchronization by using at least one correlator to correlate a received signal with synchronization codes in a primary sequence to generate corresponding synchronization values, the at least one correlator comprising a first matched filter and a second matched filter connected in series with the second matched filter comprising a plurality of chains of memory elements being connected in series, and a selector for selectively removing from the series at least one of the chains; and

during a second time interval, performing frame synchronization and cell codegroup identification by using the at least one correlator to correlate the received signal with synchronization codes in a secondary sequence to generate corresponding synchronization values.

47. (New) The computer readable medium of Claim 46, further comprising computer-executable instructions for performing steps comprising:

arranging the secondary sequence into a first portion and a second portion; and

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providing the first portion of the secondary sequence to the first matched filter, and the second portion of the secondary sequence to the second matched filter.